Exelon Generation®

Dresden Nuclear Power Station
6500 North Dresden Road
Morris, IL 60450

SVPLTR # 19-0042

10 CFR 50.73

July 2, 2019

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Dresden Nuclear Power Station, Unit 2
Renewed Facility Operating License Nos. DPR-19
NRC Docket No. 50-237

Subject: Licensee Event Report 237/2019-002-00, Unit 2 Scram due to Main Turbine Low Oil Pressure Trip

Enclosed is Licensee Event Report 237/2019-002-00, "Unit 2 Scram due to Main Turbine Low Oil Pressure Trip." This report describes an event which is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A), "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section."

There are no regulatory commitments contained in this submittal.

Should you have any questions concerning this letter, please contact Mr. Bruce Franzen at (815) 416-2800.

Respectfully,

Peter J Karaba
Site Vice President
Dresden Nuclear Power Station

IE22
NRR

Enclosure Licensee Event Report 237/2019-002-00

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Dresden Nuclear Power Station

NRC FORM 366 (04-2018)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. Facility Name	2. Docket Number	3. Page
Dresden Nuclear Power Station, Unit 2	05000237	1 OF 3

4. Title

Unit 2 Scram due to Main Turbine Low Oil Pressure Trip

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
05	09	2019	2019	- 002	- 00	07	02	2019	N/A	05000
									Facility Name: N/A	Docket Number: 05000

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. Power Level	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
100	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ Other (Specify in Abstract below or in NRC Form 366A)	

12. Licensee Contact for this LER

Licensee Contact	Telephone Number (Include Area Code)
Bruce Franzen, Regulatory Assurance Manager	815-416-2800

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES
D	TD	P	G080	Y					

14. Supplemental Report Expected	15. Expected Submission Date	Month	Day	Year
☐ Yes (If yes, complete 15. Expected Submission Date) ☒ No				

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On May 9, 2019, at 0348 CDT, Unit 2 received an automatic reactor scram as the result of the main turbine tripping due to low oil pressure from the main shaft oil pump. Following the scram, all systems operated as expected, decay heat was being removed using the steam bypass valves to the condenser, and the safety relief valves did not lift. Inspection of the main turbine front standard and main oil pump revealed damage to the spline interface between the main gear quill shaft and the high-pressure control rotor. This damage led to a loss of power transfer between the main turbine and the main oil pump which supplies bearing header pressure. This event is reportable under 10 CFR 50.73(a)(2)(iv)(A), "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section." The automatic actuation of the reactor protection system is listed in 10 CFR 50.73(a)(2)(iv)(B). The cause of the event was determined to be work order instructions contained an unrecognized critical activity that lacked the detail needed to prevent human error during installation of quill shaft oil gasket. Corrective actions include updating the model work orders for turbine front standard maintenance to include the proper level of detail and establishing new post-maintenance testing practices.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Dresden Nuclear Power Station, Unit 2	05000237	2019	- 002	- 00

NARRATIVE

PLANT AND SYSTEM IDENTIFICATION

Dresden Nuclear Power Station (DNPS), Unit 2, is a General Electric Company Boiling Water Reactor with a licensed maximum power level of 2957 megawatts thermal. The Energy Industry Identification System codes used in the text are identified as [XX].

A. Plant Conditions Prior to Event:

Unit: 02 Event Date: 05/09/2019 Event Time: 0348 CDT
Reactor Mode: 1 Mode Name: Power Operation Power Level: 100 percent

B. Description of Event:

On May 9, 2019, at 0348 CDT, with Unit 2 operating at 100 percent power, an automatic scram occurred due to the main turbine [TA] trip from low oil pressure. The Unit 2 main turbine tripped after receiving a turbine bearing oil [TD] low pressure alarm signal. The emergency bearing oil pump and the turning gear oil pump started as expected to support turbine coast down. Plant systems operated as expected in response to the automatic scram. All control rods inserted to their full-in position, Group 2 and Group 3 automatic isolations actuated as expected, decay heat was being removed using the steam bypass valves to the condenser, and the safety relief valves did not lift. Reactor vessel inventory and pressure were maintained in normal control bands. Operators performed required actions safely and in accordance with procedures and training.

Inspection of the turbine front standard found metal particulate proximal to the spline joint where the quill shaft of the main shaft oil pump interfaces with the control rotor. The quill shaft is the mechanical drive between the high-pressure rotor and the shaft driven oil pump. The inspections of the spline joint found the splines had been completely consumed.

Upon disassembly of the quill shaft, inspections found the oil supply manifold gasket to the quill shaft not cut properly. The splines of the quill are designed to be lubricated to minimize friction and allow for cooling. The gasket did not have the required hole to allow for oil flow to the quill splines. Due to lack of proper lubrication, the spline joint degraded slowly over time ultimately leading to complete material failure at the joint.

The last work record associated with the oil supply manifold gasket was in 2013 during refuel outage D2R23. Additional review shows that the work order instructions lacked any reference to a gasket detail related to its configuration.

NARRATIVE

C. Cause of Event:

The root cause of the scram event was inadequate work instructions. The 2013 work order instructions contained an unrecognized critical activity that lacked the detail needed to prevent human error during installation of the quill shaft oil gasket.

D. Safety Analysis:

The safety significance of this event was minimal. All systems responded as designed to the automatic turbine trip by initiating an automatic reactor scram without complications. Operators performed required actions safety and in accordance with procedures and training.

A risk assessment of the turbine trip was performed for this event. The resulting assessment concluded that the event was not risk significant since Conditional Core Damage Probability and Conditional Large Early Release Probability were below the threshold.

E. Corrective Actions:

Corrective actions include updating the model work orders for main turbine front standard maintenance by adding the proper level of detail when installing the quill shaft oil gasket. Also, post-maintenance testing practices for verifying oil flow are incorporated into the work orders. Additionally, actions have been created to address the extent of the identified condition.

F. Previous Occurrences:

A previous event related to a main turbine main shaft oil pump failure occurred on Dresden, Unit 3. The main shaft oil pump failure is described in LER 05000249/2019-002-00 and did not have the same causal factors.

G. Component Failure Data:

General Electric [G080] main shaft oil pump [P] failed to provide the required oil pressure for the main turbine oil system [TD].